

R E M A R K S

Careful review and examination of the subject application are noted and appreciated.

SUPPORT FOR CLAIM AMENDMENTS

Support for the amendments to the claims can be found in the drawings as originally filed, for example, on FIGS. 1, 3-5 and 8(A-D) and in the specification as originally filed, for example, on page 10, lines 14-21, on page 11, lines 1-8, on page 17, lines 4-20 and on page 23, lines 6-13. As such, no new matter has been introduced.

INFORMATION DISCLOSURE STATEMENT

In response to the Examiner's request for the dates of items L and M in the IDS filed September 21, 2001 (paper no. 4): Item L, an article entitled "Analog Recording on Phase-change Optical Disks," should have a date of 2001; Item M, an article entitled "Segmented Analog Recording Method Using Phase Change Optical Disk," should have a date of October 30, 2000.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

The rejection of claims 3-7, 11-13, 16 and 25-28 under 35 U.S.C. §102(b) as being anticipated by Fuji (U.S. Patent No. 5,537,381) has been obviated by appropriate amendment and should be

withdrawn.

Fuji is directed to a test-writing recording control method, a test writing recording control apparatus and an optical recording medium (Title of Fuji).

In contrast to Fuji, the presently claimed invention (claim 3) provides a method of recording data on a recording medium comprising (A) dividing the data into N-bit segments, where N is an integer greater than 1 and (B) mapping the data to a set of write symbols comprising 2^N distinct write symbols, where each write symbol represents a possible N-bit segment of the data. Claim 16 includes similar limitations.

Assuming, *arguendo*, the recording bit signal in FIG. 14 of Fuji is similar to the presently claimed data (as suggested on page 3, lines 1-4 and page 11, lines 15-17 of the Office Action and for which Applicants' representative does not necessarily agree), Fuji does not appear to disclose or suggest dividing the data into N-bit segments and mapping the N-bit segments of the data to a set of 2^N distinct write symbols where each write symbol represents a possible N-bit segment of data, as presently claimed. As such, the presently claimed invention is fully patentable over the cited reference and the rejection should be withdrawn.

Specifically, a first recording pattern of Fuji corresponds to 18 bits of the recording bit signal (see FIG. 14 of Fuji). A second recording pattern of Fuji corresponds to 12 bits

of the recording bit signal (see FIG. 14 of Fuji). A third recording pattern of Fuji corresponds to 25 bits of the recording bit signal (see FIG. 14 of Fuji). Since each of the recording patterns of Fuji represent a different number of bits of the recording bit signal, it follows that Fuji does not disclose or suggest dividing the data into N-bit segments and mapping the **N-bit segments** of the data to a set of 2^N distinct write symbols **where each write symbol represents a possible N-bit segment of the data**, as presently claimed. Therefore, Fuji does not disclose or suggest each and every element of the presently claimed invention, arranged as in the present claims. As such, the presently claimed invention is fully patentable over the cited reference and the rejection should be withdrawn.

With respect to claim 12, Fuji appears silent regarding using a cross correlation coefficient calculation to recover the data, as presently claimed. Specifically, the portion of Fuji cited in the Office Action states:

As shown in FIG. 10, the test-writing recording control apparatus of the present embodiment has an almost same arrangement as that of the apparatus of the first embodiment shown in FIG. 1. Difference points are that duty condition determining means 50 for determining a condition so as to optimize a duty of the reproduced signal and optimum value determining means 51 are added.

In other words, the heat interference condition determining means 49 is composed of the repeat pattern level detection means 1, the isolated pattern level detection means 2,

the comparison means 3 and the repeat/isolation pattern generating means 4 which are shown in FIG. 1. In FIG. 10, in the optical head 47 to which a recording signal z is transmitted, a semiconductor laser driving circuit 52 for outputting a driving electric current I_w which drives the semiconductor laser 23 based upon the recording signal z shown in FIG. 11, the semiconductor laser 23 and the photo detector 22 which are shown in FIG. 1 are provided (column 13, lines 50-67 of Fuji).

Nowhere in the cited passage does Fuji mention calculating a cross correlation coefficient to recover data. Furthermore, Fuji states that:

repeat pattern level detection means 1 (first level detection means) for **detecting a peak level v_1** of the reproduced signal w which correspond to the repeat mark pattern y;

isolated pattern level detection means 2 (second level detection means) for **detecting a peak level v_2** in a section of the reproduced signal w which corresponds to the isolated mark pattern x; and

comparison means 3 for outputting **the level difference Δv between the peak levels v_1 and v_2** to the repeat/isolation pattern generating means 4 (column 8, lines 33-43 of Fuji, emphasis added).

Fuji is silent regarding calculation of a cross correlation coefficient involved in either (i) detecting the peak levels V_1 and V_2 or (ii) the comparison means 3 in FIG. 1 of Fuji outputting the level difference Δv between the first peak level V_1 and the second peak level V_2 (see FIG. 1 and column 8, lines 42-43 of Fuji). Since Fuji is silent regarding calculating a cross

correlation coefficient to recover data, it follows that Fuji does not disclose or suggest each and every element of the presently claimed invention, arranged as in claim 12. As such, the presently pending claim 12 is fully patentable over the cited reference and the rejection should be withdrawn.

Similarly, claim 13 recites a combination of a cross correlation coefficient and using a comparison of a DC level to recover the data. Since, as shown above, Fuji is silent regarding a cross correlation coefficient being calculated to recover data, it follows that Fuji does not disclose or suggest a combination of a cross correlation coefficient AND comparison of a DC level to recover data, as presently claimed. As such, claim 13 is fully patentable over the cited reference and the rejection should be withdrawn.

Claims 4-11 and 17-33 depend directly from either claim 3 or claim 16 which are believed to be allowable. As such, the presently claimed invention is fully patentable over the cited reference and the rejection should be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The rejection of claims 8-10 under 35 U.S.C. §103 as being unpatentable over Fuji in view of Pettigrew et al (U.S. Patent No. 4,703,469, hereinafter Pettigrew) is respectfully traversed and should be withdrawn.

The rejection of claims 17-20 and 24 under 35 U.S.C. §103 as being unpatentable over Fuji in view of McNeil et al. (U.S. Patent No. 5,995,305, hereinafter McNeil) has been obviated by appropriate amendment and should be withdrawn.

The rejection of claims 21-23 and 29 under 35 U.S.C. §103(a) as being unpatentable over Fuji in view of McNeil in further view of Kobayashi et al. (U.S. Patent No. 5,973,333 hereinafter Kobayashi) has been obviated by appropriate amendment and should be withdrawn.

The rejection of claims 30-33 under 35 U.S.C. §103(a) as being unpatentable over Fuji in view of Ioki et al. (U.S. Patent No. 6,078,451 hereinafter Ioki) has been obviated by appropriate amendment and should be withdrawn.

Claims 4-13 and 17-29 depend directly from either claim 3 or claim 16 which are believed to be allowable. As such, the presently claimed invention is fully patentable over the cited references and the rejections should be withdrawn.

Furthermore, with respect to claims 8-10, Applicants' representative respectfully disagrees with the Examiner's position

that guard bands between tracks are also equally applicable to guard bands between write symbols on a track, as presently claimed. Specifically, Pettigrew states that the dedication of a considerable area of the disc surface to guard bands means that information packing density is reduced to a significant extent (column 1, lines 26-29 of Pettigrew). Furthermore, Pettigrew states:

We have now devised a technique whereby the function of a guard band in preventing cross-talk between adjacent tracks of information can be maintained while allowing the recording of information or control data in the guard band zones (column 1, lines 30-34 of Pettigrew).

Pettigrew further states:

. . . there is no need for empty guard bands; accordingly adjacent tracks can be of the same or closely similar width (column 1, lines 43-44 of Pettigrew).

Furthermore, Pettigrew is silent regarding inserting guard bands between the write symbols **on a track**, as presently claimed. Since Pettigrew teaches that guard bands reduce packing density significantly and discloses a technique to eliminate the need for empty guard bands, it follows that Pettigrew teaches away from inserting guard bands between write symbols on a track, as presently claimed. Therefore, the combination of Fuji and Pettigrew does not teach each and every element of the presently claimed invention and the rejection should be withdrawn.

Furthermore, with respect to claims 17-20, the Office

Action does not present a convincing line of reasoning why one skilled in the art would consider an off-track optimization algorithm of McNeil to necessarily be the same as the presently claimed genetic algorithm (see page 7, lines 1-15 of the Office Action). The Office Action also does not explain why one skilled in the art would consider a "generic" algorithm (which the Office Action states McNeil teaches) to necessarily be the same as the presently claimed "genetic" algorithm. Therefore, The Office Action does not appear to have met the Office's burden of factually establishing that the combination of Fuji and McNeil teach or suggest each and every element of the presently claimed invention. As such, the rejection should be withdrawn.

Furthermore, with respect to claims 30-32, Ioki does not appear to teach or suggest comparing an analog readout waveform signal to waveforms in pre-stored tables using predetermined pattern recognition techniques, as presently claimed. Rather, Ioki states that intervals between adjacent pulses in the read data and output of the magnetic head are counted and shaped in a pulse series (column 3, lines 62-67 and column 4, lines 1-7 of Ioki). The pulse series are compared to bit patterns (column 4, lines 23 of Ioki). One skilled in the art would not consider converting an analog waveform to a digital pulse series, as taught by Ioki, to be the same as comparing analog readout waveforms to waveforms in pre-stored tables, as presently claimed.

With respect to claim 33, Ioki is silent regarding the use of a laser, therefore Ioki can not disclose (as stated on page 11, lines 15 of the Office Action) that the variable write parameters comprise one or more of a height of a laser pulse, a duration of a laser pulse, a width of a cooling pulse following a heating pulse, an interval between adjacent laser pulses, and a power level of a laser pulse, as presently claimed. As such, the presently claimed invention is fully patentable over the cited references and the rejections should be withdrawn.

RESPONSE TO EXAMINER'S REMARKS

With respect to the Examiner's remarks in section 32(A) on page 11, the Office's position that Fuji clearly discloses each write symbol or presents more than one bit of the data has been obviated by the amendments to FIG. 2, claims 1 and 16.

With respect to the Examiner's remarks in section 32(B) on pages 11-12, Applicants' representative respectfully disagrees with the Examiner's position that FIG. 12 clearly shows 7 different waveforms, each with different characteristics obviously made from different write symbols. Specifically, Fuji states that FIG. 12 is a waveform diagram which shows recording waveforms to be recorded by the semiconductor laser driving circuit in FIG. 11 (column 7, lines 3-5 of Fuji). Fuji further states that FIG. 12 is a drawing which shows one embodiment of a waveform of a recording pulse to be

irradiated from the semiconductor laser 23 (see column 14, lines 13-15 of Fuji). Therefore, since the waveforms of FIG. 12 are recording pulses to be irradiated from the semiconductor laser 23 of Fuji, it follows that FIG. 12 does not show distinguishable readout waveforms, as presently claimed.

With respect to the Examiner's comments in section 32(C) on page 12 of the Office Action, Applicants' representative respectfully disagrees with the Examiner's position that FIG. 1 shows a comparison technique between two patterns which produces matched filter detection that recovers data in unit 4. Specifically, FIG. 1 of Fuji shows a repeat pattern level detection means 1, an isolated pattern level detection means 2, a comparison means 3 and a repeat isolated pattern generating means 4. The repeat pattern level detection means 1 presents an output representative of a peak voltage level of a repeat mark pattern Y (see FIGS. 1 and 2 of Fuji). The isolated pattern level detection means 2 presents an output consisting of a peak level of the isolated mark pattern X (see FIGS. 1 and 2 of Fuji). The comparison means 3 generates a signal representing the difference between the peak level V1 of the repeat mark pattern Y and the peak level V2 of the isolated pattern X. The comparison means 3 of Fuji does not compare "waveforms" as presently claimed, but rather detects a difference between two peak levels (i.e., V1 and V2).

With respect to the Examiner's comments in section 32(F)

on page 13 of the Office Action, Applicants' representative respectfully disagrees with the position taken that FIG. 14 and FIG. 21 of Fuji clearly show that DC level is being used to compare the patterns and hence recover the data. In particular, Fuji is silent regarding comparing the peak levels to recover data as presently claimed. Rather, Fuji is directed to minimizing the difference between peak levels of different recording patterns to allow for averaging of heat interference in the different recording patterns (see Abstract of Fuji).

SUMMARY OF TELEPHONE INTERVIEW

In telephone interviews initiated by Examiner Patel on June 4, 2004 and June 7, 2004, Applicants' representative pointed out specific locations within the specification and claims, as originally filed, that provided support for FIGS. 10A, 10B and 11, which were added in the amendment filed on April 22, 2004. Agreement was reached that the specification and claims as originally filed supported the FIGS. 10A, 10B and 11. Agreement was also reached that Applicants would provide dates for items L and M in the IDS filed September 21, 2001 (paper no. 4).

Accordingly, the present application is in condition for allowance. Early and favorable action by the Examiner is respectfully solicited.

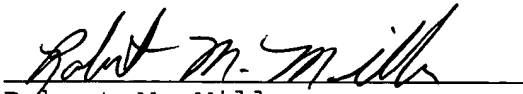
The Examiner is respectfully invited to call the

Applicants' representative at 586-498-0670 should it be deemed beneficial to further advance prosecution of the application.

If any additional fees are due, please charge Deposit Account No. 12-2252.

Respectfully submitted,

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